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NUMBER THEORY AND DIOPHANTINE ANALYSIS.

185. Proposed by R. D. CARMICHAEL, Bloomington, Ind.

Obtain the complete solution of the equatian $\phi(p^\alpha)=\phi(q^\beta)$ where ϕ denotes Euler's ϕ-function, p and q are unknown primes and α and β are unknown integers.

* * *

NOTES AND NEWS.

There has recently appeared from the publishers, Gauthier-Villars, a fine translation, by Paul Babarin, of Dr. Halsted's *Rational Geometry*. The book since its publication in English a few years ago, has been translated in German and Japanese, and now in French. In the preface of the French edition, C. A. Laisant says, among other things, that the book is clearly written, and the translation faithful and limpid, and he expresses the belief that the work is destined to exercise a profound effect upon the transformation of geometric teaching. F.

The reports of the American Committee of the International Commission on the Teaching of Mathematics, which are now being issued by the United States Bureau of Education, may be had upon application to the Commissioner of Education, Washington, D. C. Those who desire to receive these reports may thus not only get the half dozen already issued but may have their names entered so as to receive the remaining reports as fast as they are issued.

The final report of the International Commissioners is to be presented at the meeting of the International Congress of Mathematicians to be held in Cambridge, England, in August, 1912. S.

The annual resumé of doctorates conferred by American Universities, as printed in *Science* in the issue of August 18, 1911, should be of interest to readers of the MONTHLY.

It contains comparative tables showing the average number of doctorates in all subjects for each of 44 universities for the ten years, 1898-1907; the total number for the fourteen years, 1898-1911; the actual number for each of the years, 1908, 1909, 1910, 1911, together with the corresponding data for doctorates in the sciences including mathematics.

The universities which have conferred more than 100 doctorates during the last fourteen years are: Columbia 555, Chicago 545, Harvard 495, Yale 452, Johns Hopkins 411, Pennsylvania 341, Cornell 306, Wisconsin 152, Clark 137, and New York 123. Those showing an average of more than 10 during the ten years 1898-1907 are: Chicago 35.6, Harvard 33.8, Columbia 32.2, Yale 31.8, Johns Hopkins 30,5, Pennsylvania 22.5, and Cornell 18.1.

Those conferring more than 20 doctorates in 1911 are: Columbia 75, Chicago 55, Harvard 42, Cornell 34, Yale 31, Pennsylvania 29, Johns Hopkins 28.

In the sciences the institutions conferring a total of more than 100 doctorates in the last fourteen years are: Chicago 280, Johns Hopkins 239, Columbia 218, Harvard 198, Cornell 197, Yale 194, Pennsylvania 143, and Clark 126. Those having an average of more than 10 during the ten years, 1898-1907, are: Johns Hopkins 16.8, Chicago, 16.4, Harvard 14.1, Columbia 13.4, Yale 12.4, and Cornell 10.4. Those conferring 10 or more doctorates in the sciences in 1911 are: Chicago 35, Columbia 29, Cornell 27, Harvard 20, Johns Hopkins 19, Clark 16, Yale 15, Wisconsin 13, and Pennsylvania 10.

The total number of doctorates conferred in the last fourteen years by the 44 universities given in the tables is 4286, the total number in the sciences being 2037, or 48 per cent of the whole number. The total number for 1911 was 437, of which 239 were in the sciences, and the total average for the ten years, 1898-1907, was 272.4 of which 124.1 belong to the sciences.

The numbers in the various departments are also of interest. Those departments credited with a total of over 100 during the last fourteen years are chemistry 533, physics 264, zoölogy 244, psychology 222, mathematics 206, botany 183, English 121, geology 114, and history 105. Those departments showing more than 10 doctorates in 1911 are: chemistry 65, physics 37, English 33, history 26, philosophy 26, zoölogy 25, mathematics 25, psychology 23, education 23, botany 20, sociology 18, economics 16, geology 15, romance languages 12, Latin 11, and agriculture 11.

The following quotation from the report is significant of the trend with respect to the sciences:

"The number of doctorates in the natural and exact sciences is increasing more rapidly than in other subjects. Prior to 1908 the average number of degrees conferred in the sciences was 124, as compared with 198 in the other group, in the three following years the average numbers were 186 and 189, respectively; and this year the numbers were 239 and 198. As shown in the table, Chicago is the university which has conferred the largest number of degrees in the natural and exact sciences, followed by Johns Hopkins and Columbia. Of the degrees conferred by Cornell, 64 per cent have been in the sciences, at the Johns Hopkins 58 per cent, at Harvard 40 per cent, at Columbia 37 per cent. It is somewhat curious that the percentage at Wisconsin, Michigan, Illinois, and Minnesota should be as small as 42, 39, 54, and 37, respectively, as it is the general impression that the sciences are especially emphasized at the State universities."

The 25 doctorates in mathematics in 1911 were distributed as follows: Chicago 5, Yale 5, Clark 2, Johns Hopkins 2, Princeton 2, Pennsylvania 2, Columbia 1, Illinois 1, Michigan 1, Syracuse 1, Harvard 1, Cornell 1, and Cincinnati 1.

S.

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